AMENDMENTS TO THE SPECIFICATION

Please amend the specification starting on page 1, line 3 (numbered line 4) and ending on page 8, line 21 (numbered line 23) as follows:

BACKGROUND

The invention relates to a motor vehicle safety device for protecting pedestrians and cyclists~~, in accordance with the precharacterizing clause of claim 1~~.

In addition to other safety devices for protecting pedestrians and cyclists (EP 0967 128 A2, DE 101 02 597 A1, DE 100 14 832 A1), EP 1176062A2 discloses a motor vehicle airbag system ~~is known (EP 1 176 062 A2) having~~ that has airbags that ~~which~~ cover the region ~~of the A-pillars~~ between the A-pillars of the motor ~~vehicle~~ vehicle, in the case of an accident with a pedestrian or cyclist. ~~Said airbags~~ The airbags are intended~~, in particular,~~ to lessen the impact of the pedestrian or cyclist's (hereinafter collectively "pedestrian") head onto the A-pillar, ~~pillar. Said airbags~~ cover only a small part of the ~~windshield, in~~ windshield (in order not to impede the vision of the ~~driver, and~~ driver). As a result, the airbags disclosed in EP 1176062A2 are ~~therefore~~ narrow and may be unstable on account of the small volume. This results in the disadvantage that, in the event of an oblique impact of a pedestrian, the ~~person, said~~ airbags may be inadvertently ~~can be~~ pushed aside by the pedestrian, thereby enabling the pedestrian to collide ~~to the side by said person, with the result that the person collides~~ with motor vehicle parts such as ~~parts, in particular with the A pillar,~~ one of the A-pillars, i.e., the ~~and the~~ intended protection ~~cannot~~ does not occur.

~~The invention is therefore based on the object of preventing the collision of a pedestrian or cyclist with the A pillar and adjoining parts of the motor vehicle, even in the event of an oblique collision, in the case of a safety device which also ensures good vision for the driver after the collision~~.

SUMMARY

An embodiment of the invention is directed to a motor vehicle safety device for protecting pedestrians and cyclists. The safety device includes: at least one airbag that is configured to be arranged under a hingedly connected hood of the vehicle; and at least one gas generator connected to the airbag(s). During inflation, the airbag(s) are configured to lift at least a portion of the hood such that sections of the airbag(s) can thereafter unfold onto A-pillars and a lower portion of a windshield of the vehicle. When unfolded, the airbag(s) is configured to have at least one chamber below the hood in the vicinity of each of the hinges

of the hood and lateral ends of the airbag(s), which are configured to cover the A-pillars, point upward. The airbag sections, which are configured to unfold in front of the A-pillars, are fixed by at least one restraining member to prevent their lateral displacement.

In a further embodiment of the safety device, the at least one restraining member may be an intercepting strap or a tube-shaped airbag.

In another further embodiment of the safety device, the at least one restraining member may be an intercepting strap or a tube-like airbag that connects the lateral ends of the airbag(s) to one another.

In another further embodiment of the safety device, the at least one restraining member may be a pair of intercepting straps or tube-like airbags. Further, a first of the intercepting straps or tube-like airbags may connect a first of the lateral ends of the airbag(s) to a portion of the airbag(s) that is below the hood and is on an opposite, second side of the vehicle. Similarly, a second of the intercepting straps or tube-like airbags may connect a second of the lateral ends of the airbag(s) to a portion of the airbag(s) that is below the hood and is on an opposite, first side of the vehicle.

In another further embodiment of the safety device, the straps or tube-like airbags may cross in a central portion of the vehicle.

In another further embodiment of the safety device, the at least one restraining member may be a pair of intercepting straps or tube-like airbags. Further, a first end of a first of the intercepting straps or tube-like airbags may be connected to a first of the lateral ends of the airbag(s) and a second end of the first of the straps or tube-like airbags may be connected to the vehicle. Similarly, a first end of a second of the intercepting straps or tube-like airbags may be connected to a second of the lateral ends of the airbag(s) and a second end of the second of the straps or tube-like airbags may be connected to the vehicle.

In another further embodiment of the safety device, the second ends of intercepting straps or tube-like airbags may be connected to a central section of a module housing that is part of the vehicle and that is below the hood.

In another further embodiment of the safety device, the at least one restraining member may be two pairs of intercepting straps or tube-like airbags. Further, a first of the two pairs of intercepting straps or tube-like airbags may restrain inner and outer sides of a first of the lateral ends of the airbags(s). Similarly, a second of the two pairs of intercepting straps or tube-like airbags may restrain inner and outer sides of a second of the lateral ends of the airbags(s).

In another further embodiment of the safety device, the safety device may additionally include: at least one reinforcement that is provided in the vicinity of each of the lateral ends of the airbag(s).

In another further embodiment of the safety device, the at least one reinforcement may be a seam.

In another further embodiment of the safety device, the at least one reinforcement may be a transparent airbag that is provided between the lateral ends.

In another further embodiment of the safety device, the at least one reinforcement may be transparent woven fabric insert that extends from each lateral end into a central region of the airbag.

In another further embodiment of the safety device, the safety device may additionally include: a guide system for guiding the lateral ends of the airbag(s) during inflation. The guide system may be connected to the airbag(s) and may be provided in the vicinity of the A-pillars.

In another further embodiment of the safety device, the guide system may have a guide rail on each A-pillar. Further, a guide part may be provided on each guide rail. The guide parts may be connected to the airbag(s) and may be configured to be displaced during inflation of the airbag(s).

In another further embodiment of the safety device, the chambers that are below the hood in the unfolded state may be connected to a gas generator via feed lines.

In another further embodiment of the safety device, the airbag(s) may have at least one outflow opening for energy absorption.

In another further embodiment of the safety device, the airbag(s) may be subdivided into at least four chambers by tucks and/or dividing walls.

In another further embodiment of the safety device, the chambers may be connected to one another in such a way that a volume can be displaced between them.

~~According to the invention, this is achieved in accordance with the features of claim 1.~~

In a motor vehicle safety device for protecting pedestrians and cyclists, having at least one airbag which is arranged under the engine hood, is connected to at least one gas generator, unfolds to protect a pedestrian or cyclist who strikes the vehicle and, in the process, initially lifts up the engine hood from the motor vehicle, at least at the location of the unfolding of the airbag, to such an extent that the airbag can unfold outwardly in a second phase, according to the invention, in the unfolded state, the airbag has two chambers under

the engine hood in the region of the hinges of the engine hood. The airbag extends above the engine hood over the entire width of the motor vehicle in front of the lower region of the windshield and the A-pillars ~~A pillars~~ of the motor vehicle, and the lateral ends of the airbag which, in particular, cover the A-pillars ~~A pillars~~ point upward after the unfolding of said airbag and are additionally fixed. The unfolded airbag thus has a U shape.

~~The result of~~ By minimizing the displacement of the upwardly pointing ends, which ~~which~~ cover the rigid regions of the vehicle adjoining the engine ~~hood is~~ hood, a high and reliable potential for protection is generated. ~~Additional fixing~~ The additional fixation of the upwardly pointing ends ~~ensures the~~ ensures protection during a ~~against~~ collision, in particular, with the ~~A pillars~~ A-pillars, even in the event of an oblique collision~~, for example from the center of the windshield~~. The forces are introduced favorably by raising the engine hood over a wide area in the hinge region, which leads to relatively small deformations of the engine hood and thus to a reduction in oscillations.

The lateral ends of the airbag can be fixed in a variety of ~~different~~ ways. For example, at least ~~At least~~ one intercepting strap or one tube-shaped airbag can ~~thus~~ be provided as a means for fixing the lateral ends of the airbag. In ~~Here, there is provision in~~ one embodiment, the ~~for the~~ lateral ends of the airbag ~~to be~~ may be connected to one another by such an intercepting strap or a tube-like airbag. Moreover, ~~There is provision~~ in a second ~~further~~ embodiment, the ~~for the~~ lateral ends of the airbag ~~to be~~ may be connected to the lower region of the airbag section ~~which lies~~ that is on the opposite side of the vehicle ~~side via~~ via intercepting straps ~~which extend crosswise or via~~ of tube-like airbags that extend crosswise. ~~There is provision in~~ In a third embodiment, the ~~for the~~ lateral ends of the airbag ~~to be~~ may be fixed by intercepting straps or tube-like airbags, the other ends of which are fastened to the motor vehicle (e.g., ~~for example are connected to~~ the central section of a module housing ~~which~~ that is arranged below the engine ~~hood~~ hood). ~~There is provision in a further~~ In a fourth embodiment, each ~~for each~~ lateral end of the airbag ~~to be~~ may be fixed by two intercepting straps or two tube-like airbags ~~which emerge~~ that extend from the outer side and the inner side of the respective lateral end.

The lateral ends can also be stabilized by ~~providing~~ reinforcements ~~of the airbag in this region. At~~ such as least one seam ~~can be provided as reinforcement. However, at least one~~ or transparent airbag ~~can also be provided as reinforcement~~. In one embodiment, at least one transparent reinforcement ~~airbag is~~ airbag may be arranged between the lateral ends. In another ~~a further~~ embodiment, at least one transparent woven fabric insert may extend ~~extends~~ from each lateral end into the central region of the airbag. A further possibility for

supporting the lateral ends of the airbag consists in that a guide system, which ~~which~~ is connected to the ~~airbag~~ airbag, is provided in the region of the ~~A-pillars~~ A-pillars. With the aid of such a guide system, ~~with the aid of which guide system~~ the lateral ends of the airbag ~~are guided~~ may be guided during ~~its unfolding~~ inflation. The guide system ~~preferably has~~ may have a guide rail on each ~~A-pillar, on which guide rail a~~ A-pillar. A guide part, which is provided on the guide rail and which is connected to the ~~airbag~~ airbag, can be displaced during the unfolding of the airbag.

The at least one gas generator ~~is connected~~ may be connected to those sections or chambers of the airbag ~~which lie~~ that are below the engine hood in the unfolded state directly or indirectly via feed lines. As a result, ~~This achieves the situation in which first~~ the region of the airbag below the engine hood is ~~filled~~ inflated first and subsequently the remaining portions of the airbag ~~volume for the adjoining regions~~ are inflated.

The airbag ~~has at~~ may have at least one outflow opening for energy absorption ~~by means of said airbag~~. In an airbag without an outflow opening, the airbag may be ~~said airbag is~~ subdivided into chambers by tucks and/or dividing walls for energy absorption ~~by means of said airbag~~. The chambers ~~are connected~~ may be connected to one another in such a way that a volume of gas can be displaced between them counter to a defined amount of resistance. In other words, ~~that is to say the energy is~~ the energy may be absorbed by the work ~~carried out~~ undertaken to displace the volume of gas between the chambers.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only, and are not restrictive of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present invention will become apparent from the following description, appended claims, and the accompanying exemplary embodiments shown in the drawings, which are briefly described below.

~~The invention is to be explained in exemplary embodiments using the drawings, in which:~~

~~fig. 1A~~ Fig. 1A shows a ~~detail of the~~ front view of a motor vehicle with an unfolded airbag and a first embodiment ~~of the~~ of an additional fixing means for the lateral ends of the unfolded airbag;

~~figures~~ Figs. 1B, 2A and 2B show the ~~detail~~ motor vehicle according to ~~fig. 1A~~ Fig. 1A with three further embodiments of the fixing means for the lateral ends of the unfolded airbag;

~~fig. 3~~ Fig. 3 shows an embodiment ~~having~~ of an airbag that has stabilizing tucks in the woven fabric of the airbag;

~~fig. 4~~ Fig. 4 shows an embodiment of ~~the airbag having~~ an airbag that has transparent woven fabric inserts;

~~fig. 5~~ Fig. 5 shows an embodiment ~~having~~ of an airbag that has a guide system for the lateral ends of the airbag; and

~~fig. 6~~ Fig. 6 shows an unfolded airbag ~~in the unfolded state, said airbag having~~ that has separate chambers below the engine hood.

DETAILED DESCRIPTION

The arrangement of the airbag 1 in the front region of a motor vehicle can be seen from Figs. ~~figures~~ 1A, 1B, 2A, 2B, 4 and 5. The figures show the ~~A pillars~~ A-pillars 17, 18 and the engine hood 19. An airbag is shown in an embodiment having chambers 15, 16, which are ~~which lie~~ below the engine hood 19 in the region of hinges 19a, 19b in the unfolded position shown. The airbag, which is assigned a module housing 20 that ~~which~~ is arranged below the engine hood 19, has ~~and has~~ at least one gas generator (not shown). The lateral ends 2, 3 of the airbag are additionally fixed in the embodiment ~~of fig.~~ of Fig. 1A by an intercepting strap 21 that ~~which~~ extends between the lateral ends 2, 3. As a result, the lateral yielding of the lateral ends 2, 3 is prevented to a very large extent, even in the event of a lateral impact of a pedestrian. Moreover, as the ~~person. As the~~ intercepting strap 21 is narrow, the vision of the driver is barely impeded. The same effect is achieved if, instead of the intercepting strap 21, a tube-shaped airbag 21a is provided, the diameter of which corresponds at least approximately to the width of the intercepting strap 21. In the embodiment ~~of fig.~~ of Fig. 1B, two intercepting straps 22, 23 (or ~~23 or~~ corresponding tube-shaped airbags 22a, ~~23a which~~ 23a), which extend ~~crosswise~~ crosswise, are provided. Here, one end of the intercepting strap 22 is connected to the lateral end 2, while the other end is connected in the region of the chamber 16 to the airbag section lying ~~opposite.~~ under the hood 19. Similarly, one end ~~One end~~ of the intercepting strap 23 is connected at the lateral end 3 of the airbag and the other end is connected in the region of the chamber 15 to the airbag section lying ~~opposite~~ under the hood.

In both embodiments, transparent airbags 24 for stabilizing the lateral ends 2, 3 could be provided instead of the intercepting straps 21, 22, 23 or tube-shaped airbags of small diameter 21a, 22a, 23a. The upper, ~~the upper~~ edge of such a transparent airbag 24 ~~which~~ is indicated in each case by a dashed line in Figs. ~~figures~~ 1A and 1B. Transparent ~~Said~~

~~transparent~~ airbags of this nature impede the vision of the driver only to a minimal ~~minimum~~ extent.

In the embodiment ~~of fig.~~ of Fig. 2A, intercepting straps 25, 26 or tube-shaped airbags 25a, 26a extend from the inner sides 27, 28 of the lateral ends 2, 3 of the airbag 1 and connect to the central region of the module housing 20 ~~and are connected to the latter there~~. In a further embodiment, as shown ~~in fig.~~ in Fig. 2B, intercepting straps 31, 32 or tube-shaped airbags 31a, 32a additionally also extend from the outer sides 29, 30 of the lateral ends 2, 3 to the edge regions of the module housing 20 ~~and are connected to the latter there~~.

In the embodiment ~~of fig.~~ of Fig. 3, tucks 33 are provided for stabilizing the lateral ends 2, 3.

In the embodiment ~~of fig.~~ of Fig. 4, the inner sides 27, 29 of the lateral ends 2, 3 are provided ~~by means of~~ with transparent woven fabric layers 34, 35. The fabric layers 34, 35 ~~which~~ extend obliquely downward from the inner sides 27, 28 of the lateral ends 2, 3 of the airbag 1 and are connected to the airbag ~~there~~ in the central section of the ~~said~~ airbag 1.

Fig. 5 shows an embodiment in which the lateral ends 2, 3 are connected to a guide system. In the region of the ~~A pillars~~ A-pillars, the~~, said~~ guide system has guide rails 36, 37 that ~~which~~ extend ~~as far as~~ under the engine hood 19. The ~~Said~~ guide rails 36, 37 are assigned guide parts 38, 39, which ~~which~~ are connected to the rear sides of the lateral ends 2, 3. The ~~on the rear side of the latter. Said~~ guide parts 38, 39, which are enclosed by ~~enclose~~ the guide rails, ~~so that they are not released from them and~~ can move only in their longitudinal direction. During the unfolding of the airbag, the guide parts 38, 39 upwardly slide on the guide rails 36, 37 ~~from the bottom to the top~~, until they reach ~~have reached~~ the end position, which ~~which~~ is shown ~~in fig.~~ in Fig. 5.

In all the embodiments shown, only the lower region of the windshield is covered by the airbag 1 as a consequence of the U shape of the unfolded airbag. The ~~Secondly, however, the~~ region of the ~~A pillars~~ A-pillars is, however, stably covered ~~stably~~ by the ~~airbag, with the result that~~ airbag. As a result, even in the event of an oblique impact of a ~~person~~ pedestrian, displacement of the related airbag sections is largely prevented ~~to a very large extent~~.

In the embodiment ~~of fig.~~ of Fig. 6, there are two chambers 15, 16 that ~~which~~ are arranged in the region of the hinges 19a, 19b of the engine hood 19. Two possibilities are shown in this figure for improving the dissipation of energy during the impact of a pedestrian ~~or cyclist~~. The lateral end 2 is thus separated from the remaining region by tucks ~~4a, b, which leaves~~ 4a, 4b, thereby leaving only a small opening 5 for the entry of gases into the lateral end 2. As a result, ~~with the result that~~ a separate chamber is formed. Further, although the

~~Although this~~ opening 5 allows rapid unfolding of the airbag on account of the high pressure of the gases, volume equalization to the remaining airbag region is delayed in the event of a collision of a ~~person~~ pedestrian. In other words, ~~that is to say~~ resistance is generated to the displacement of the gas volume from the impact region as a result of the subdivision of the gas sack into chambers and appropriately dimensioned overflow regions. In this embodiment, the upper part 1b has a further chamber 1c that ~~which~~ likewise serves to improve the dissipation of energy in the impact region.

The dissipation of energy is improved at the lateral end 3 by a tuck 6, which ~~which~~ extends in the center thereof. Tucks 9, 10, which ~~which~~ leave only small openings 11 to 14 between the parts 1a and ~~1b are~~ 1b, are provided between those chambers 15, 16 of the airbag ~~which~~ that remain below the engine hood after the unfolding of the airbag ~~and the part 1b of the airbag~~. This achieves the situation in which the chambers 15, 16, which raise ~~which lift up~~ the rear region of the engine hood (not shown here), unfold first. As a result, ~~unfold first of all, with the result that~~ the upper part 1b can subsequently unfold above the engine hood 19 in front of the lower region of the windshield and the ~~A pillars~~ A-pillars 17, 18.

Given the disclosure of the present invention, one versed in the art would appreciate that there may be other embodiments and modifications within the scope and spirit of the invention. Accordingly, all modifications attainable by one versed in the art from the present disclosure that are within the scope and spirit of the present invention are to be included as further embodiments of the present invention. The scope of the present invention is to be defined as set forth in the following claims.